

The Nuts & Bolts of Finger Amputation

by [Kirsten Liu, MD](#) and [Peter Pryor, MD](#) on [October 21, 2011](#)

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Fingertip Amputation: Depending on where you practice, you might be the hand surgeon.

A 21-year-old, right-hand dominant male without significant past medical history, presents to your emergency department after a pallet of bricks fell on his left, ring finger, while at work just prior to arrival. His vaccinations are up to date. On exam, he has amputated his ring finger just distal to the DIP joint, and bone is exposed at the site of injury. Bleeding is controlled with direct pressure. The distal tip of his finger is not at the bedside. Amputations seen in the emergency department are often a result of penetrating injuries (involving a variety of machines), blunt injuries (crush injuries), self-inflicted injuries, or thermal injuries (electrical burns or frostbite). Finger tip amputations are the most common type of amputation of the upper extremity. The first goal in treating any patient with an amputation is to evaluate for concomitant serious injury. Once that has been evaluated, the goals of treating a fingertip amputation are to: (1) preserve functional length, (2) achieve durable coverage, (3) achieve near-normal sensibility, (4) prevent adjacent joint contracture, (5) achieve early functional recovery, and (6) pain control.

Fingertip amputations may be classified into 3 categories, based on zone of injury. Zone I refers to injuries distal to the bony phalanx and may generally be treated conservatively for wounds <1 cm² in adults (recovery usually takes up to 6 weeks and mandates frequent dressing changes). In zone II injuries, bone is exposed. Zone III injuries result in the loss of bone and the entire nail bed. Injuries in zone II or III may require flap coverage but most of these fingertip injuries may be treated on an outpatient basis. Consider radiographs if bony injury or avulsion is suspected. When in doubt, order the X-ray.

If a small bony protuberance (<0.5 cm in length) distal to the DIP is exposed in a wound, skin closure may not be possible without cutting back the bone. To rongeur a bone while managing a fingertip amputation, follow these steps:

1/ Treat these as open fractures, start IV antibiotics (often first-generation cephalosporins) and update tetanus immunization if the patient has not received a booster within 5 years.

2/ Control hemorrhage with direct pressure. Of note, direct pressure may be painful, so gentle pressure at the base of the digit, effectively blocking the blood vessels is sufficient for bleeding control (until a digital block can be performed and direct pressure may be applied).

3/ Assess the neurovascular status. Also assess for tendon involvement (flexor and extensor tendons of the hand). If there is tendon involvement, prompt referral to a hand surgeon is mandated (consult hand surgery if available; or follow-up within 5 days).

4/ Anesthetize the finger with a digital block.

5/ Irrigate the wound thoroughly. For irrigation, one may use a 60cc syringe with an 18-gauge angiocatheter sheath for proper pressure or use

a 1000cc saline bag, cut the tip open and irrigate (image 1).



6/ Next, re-examine the wound once it has been carefully irrigated. As shown in image 2, note the phalangeal bone protruding through the wound.

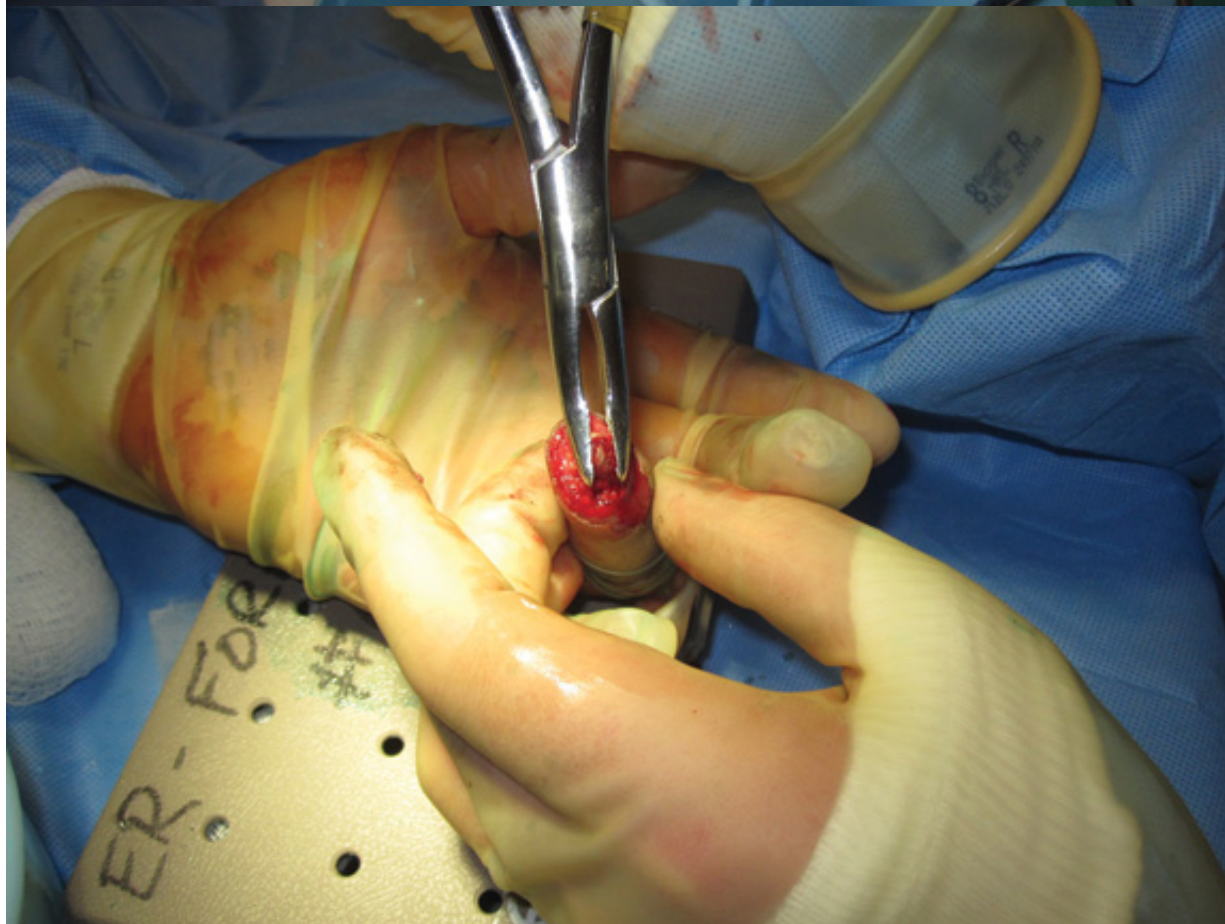


7/ After irrigating, cover the wound with a sterile glove (you may dress the patient in a sterile gown for a larger field). To maintain a bloodless field, you may cut the tip off the glove for the finger of interest, then roll back that fingertip until the patient's finger is visualized. This will function as a tourniquet, but remember to remove the tourniquet as soon as possible to prevent potential injury (image 3).



8/ Next, use a rongeur bone cutter to slowly cutback the bone (image 5). To use the rongeur, grasp the two ends with one hand (like pliers), then cut through the exposed bone by taking small millimeter chips away from bone.

9/ Continue cutting back the bone until you have enough soft tissue or skin over the bone through which to place a suture without overly stretching the skin.



10/ Finally, use non-absorbable sutures to close the edges of skin and soft-tissue over the bone with simple interrupted stitches.

11/ Apply antibiotic ointment and cover with dressing. Have the patient return in 24-48 hours for wound recheck, as well as with hand surgery within 1 week. Patients

should be discharged with a course of antibiotics (for example, Keflex) effective against skin pathogens.



A note regarding replantation:

After serious injury has been ruled out, assessing the viability of an amputation for replantation is the next step. The following injuries should be evaluated for replantation as patients will benefit functionally: (1) injuries involving the thumb, (2) multiple fingers, (3) the hand at the level of the wrist or

distal forearm, (4) the arm at the level just proximal to the elbow, (5) possibly single digit amputations in setting of prior finger amputations of the same hand, and (6) any part in a child. Next, evaluate the amputated part. The stump should be wrapped in saline-moistened gauze, then placed in a plastic bag, sealed, and finally placed on ice. Do NOT place directly onto ice as this could result in frostbite injury. Nor should the part be immersed in water, as replantation of vessels becomes more difficult. Call your surgeon immediately. Time is ischemia. Approximate times allowable are: 12 hours warm and 24 hours of cold ischemia for digits, 6 hours of warm and 12 hours of cold ischemia for major body parts. Take a radiograph of both amputated part and stump pre-operatively for planning. Photograph both parts, if available. Give antibiotics, update tetanus and resuscitate with fluids while waiting for surgery.

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